Stoller
Hanford Office

DOE-EM/GJ763-2004

699-17-27P (C4570)
Log Data Report

Borehole Information:

Borehole: 699-17-27P (C4570)			**Site:** North of K-East Reactor		
Coordinates (WA State Plane)		**GWL (ft)[1]:** None		**GWL Date:**	
North	**East**	**Drill Date**	**TOC[2] Elevation**	**Total Depth (ft)**	**Type**
Not Available	Not Available	09/04	Not Available	26	Not available

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Carbon steel	3	6 5/8	5 1/2	9/16	3	26

Borehole Notes:

Casing depth information was provided by the Fluor Hanford drilling supervisor. The logging engineer measured casing diameter and stickup using a steel tape and rounding the measurements to the nearest 1/16 in. Logging measurements are referenced to the ground surface.

Logging Equipment Information:

Logging System:	Gamma 4E		**Type:** SGLS (70%) 34TP40587A
Calibration Date:	05/2004	**Calibration Reference:**	DOE-EM/GJ692-2004
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	**1**	**2 Repeat**			
Date	09/27/04	09/27/04			
Logging Engineer	Pearson	Pearson			
Start Depth (ft)	0.0	22.0			
Finish Depth (ft)	26.0	19.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
ft/min	N/A[3]	N/A			
Pre-Verification	DE371CAB	DE371CAB			
Start File	DE371000	DE371027			
Finish File	DE371026	DE371030			
Post-Verification	DE371CAA	DE371CAA			
Depth Return Error (in.)	N/A	- 1/2			

Log Run	1	2 Repeat			
Comments	No fine gain adjustment.	No fine gain adjustment.			

Logging Operation Notes:

Logging was performed with a centralizer installed on the sonde. Pre- and post-survey verification measurements for the SGLS employed the Amersham KUT (^{40}K, ^{238}U, and ^{232}Th) verifier with serial number 118. Zero reference is the ground surface.

Analysis Notes:

Analyst:	Henwood	Date:	12/07/04	Reference:	GJO-HGLP 1.6.3, Rev. 0

SGLS pre-run and post-run verification spectra were collected at the beginning and end of each day. All of the verification spectra were within the acceptance criteria. Examinations of spectra indicate that the detector functioned normally during logging, and the spectra are accepted.

Log spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Verification spectra were used to determine the energy and resolution calibration for processing the data using APTEC SUPERVISOR. Concentrations were calculated in EXCEL (source file: G4EJul04.xls). The casing configuration was assumed as one string of 6-in. casing with a thickness of 9/16 in. to 26 ft. No dead time or water corrections were required.

Log Plot Notes:

Separate log plots are provided for gross gamma and dead time, naturally occurring radionuclides (^{40}K, ^{238}U, and ^{232}Th), and man-made radionuclides. Plots of the repeat logs versus the original logs are included. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable level (MDL) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, or casing correction. These errors are discussed in the calibration report. A combination plot is also included to facilitate correlation. The ^{214}Bi peak at 1764 keV was used to determine the naturally occurring ^{238}U concentrations on the combination plot rather than the ^{214}Bi peak at 609 keV because it exhibited slightly higher net counts per second.

Results and Interpretations:

^{137}Cs was detected near the ground surface at concentrations of approximately 0.5 pCi/g. ^{137}Cs was also detected at 6 and 26 ft near the MDL of approximately 0.2 pCi/g. These identifications near the MDL are the result of statistical fluctuations and are likely not actual detections.

The plots of the repeat logs demonstrate reasonable repeatability of the SGLS data for the natural radionuclides.

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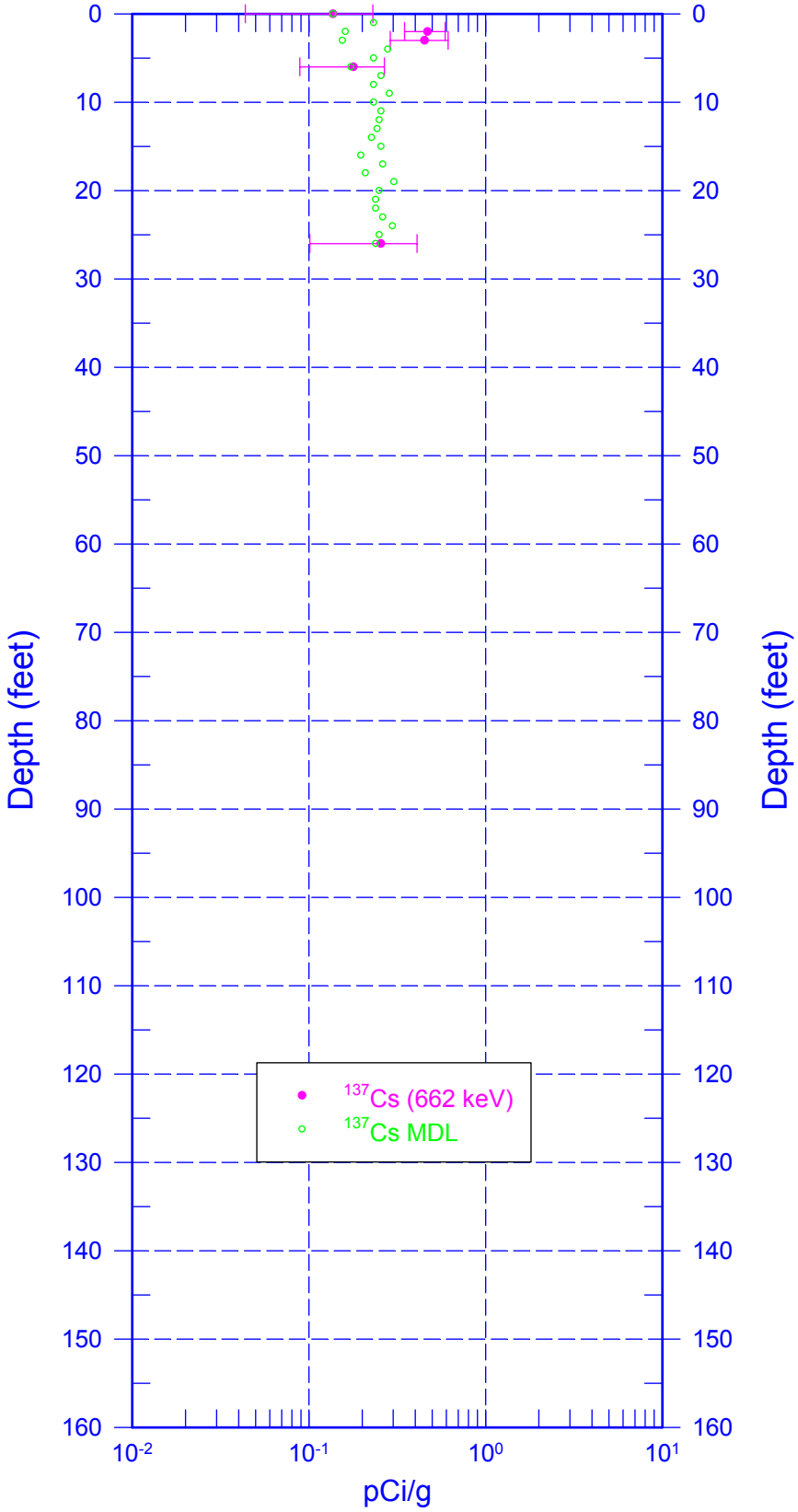
[1] GWL – groundwater level
[2] TOC – top of casing
[3] N/A – not applicable

699-17-27P (C4570)
Man-Made Radionuclides

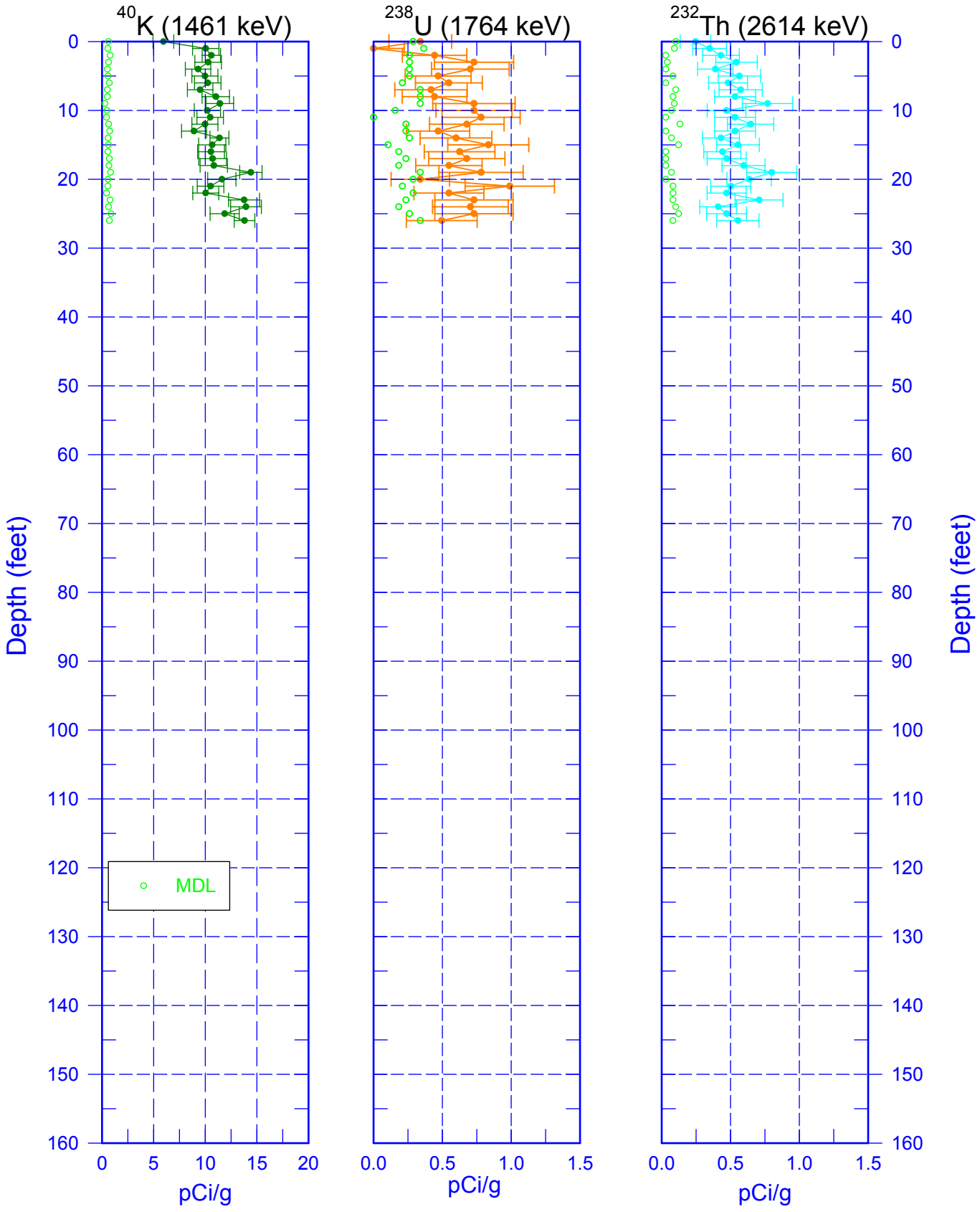


Zero Reference - Ground Surface

Depth scale: 1" = 20 ft

Last Log Date - 09/27/04

699-17-27P (C4570)
Natural Gamma Logs

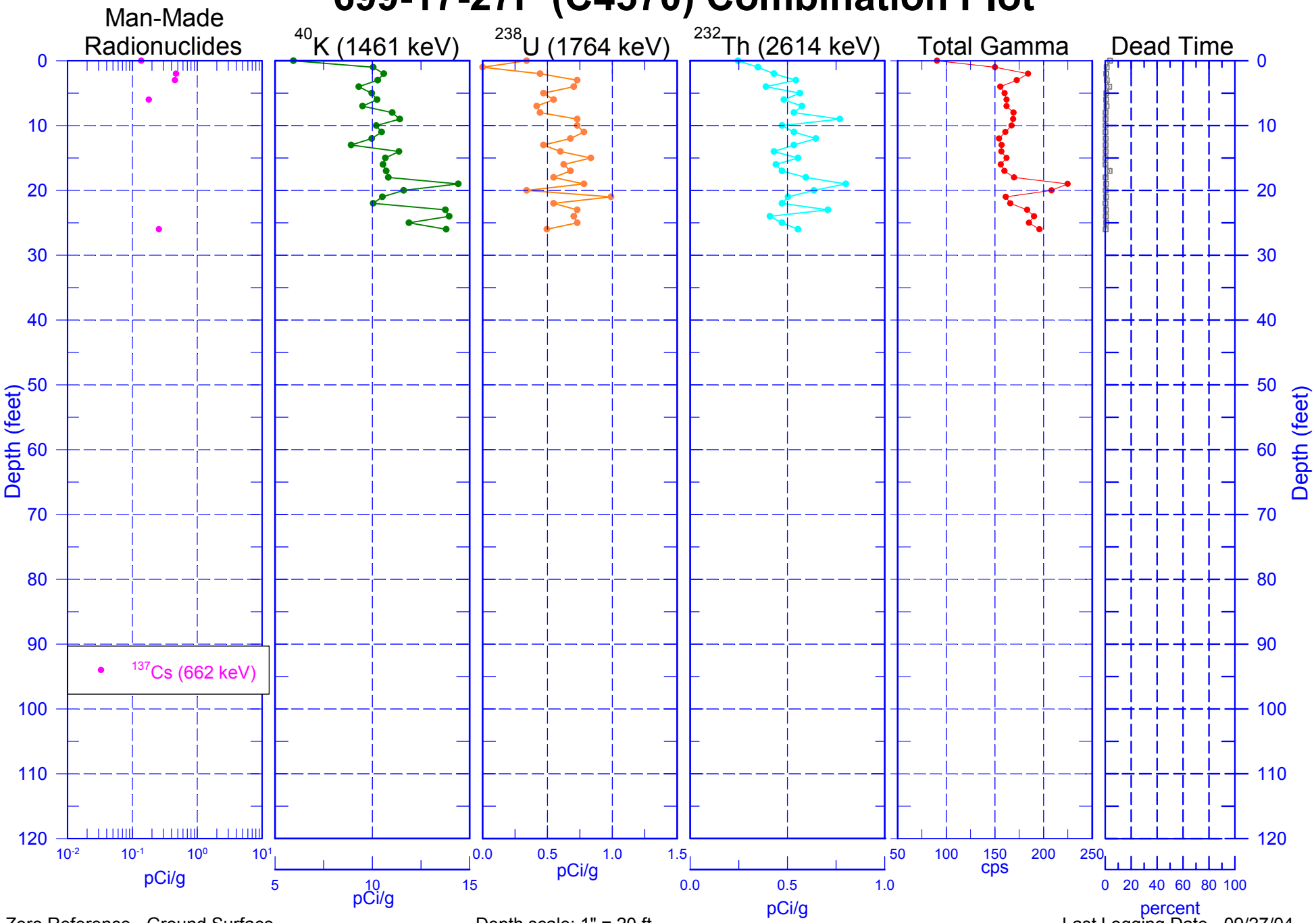


Zero Reference = Ground Surface

Depth scale: 1" = 20 ft

Last Log Date - 09/27/04

699-17-27P (C4570) Combination Plot

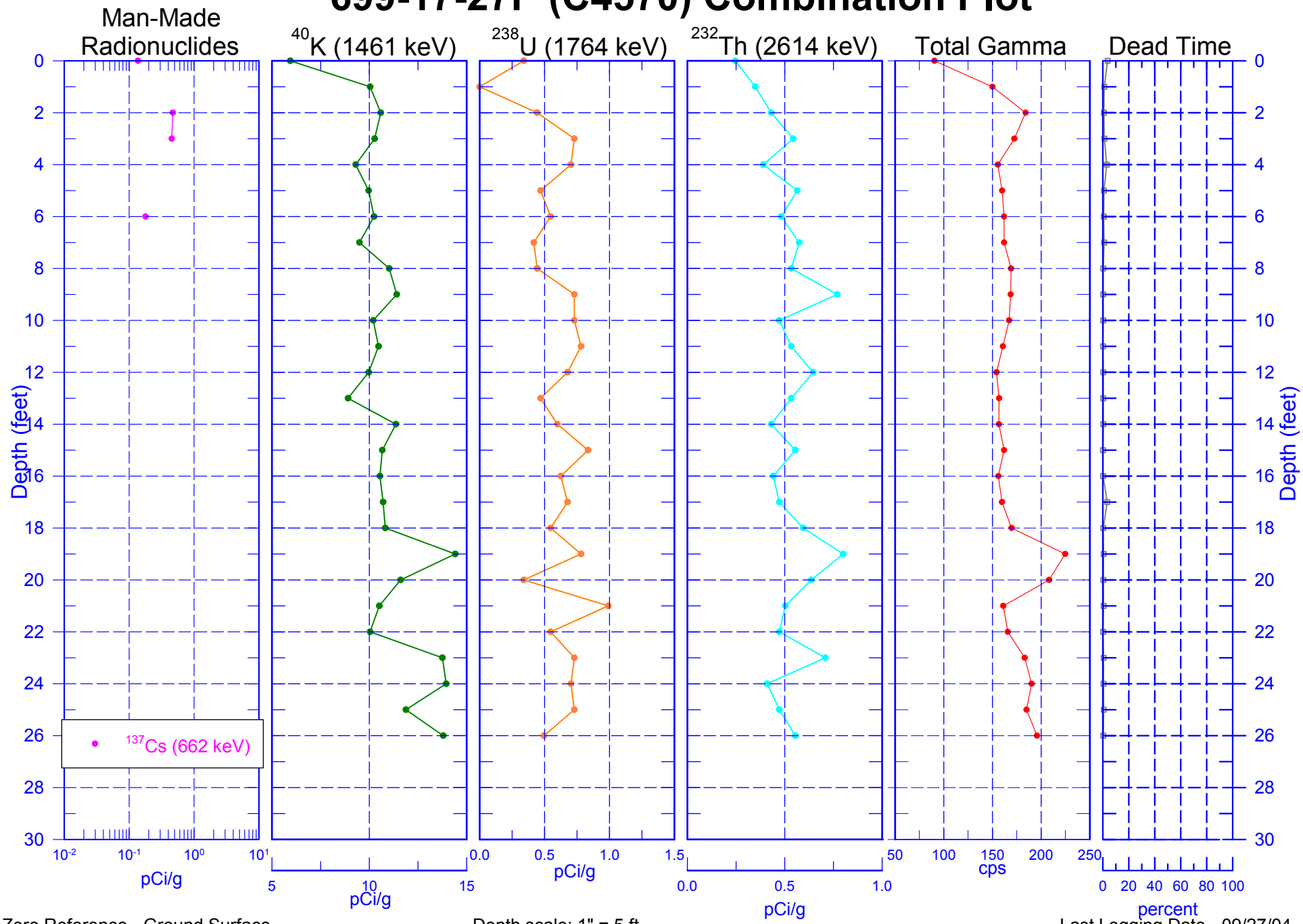


Zero Reference - Ground Surface

Depth scale: 1" = 20 ft

Last Logging Date - 09/27/04

699-17-27P (C4570) Combination Plot

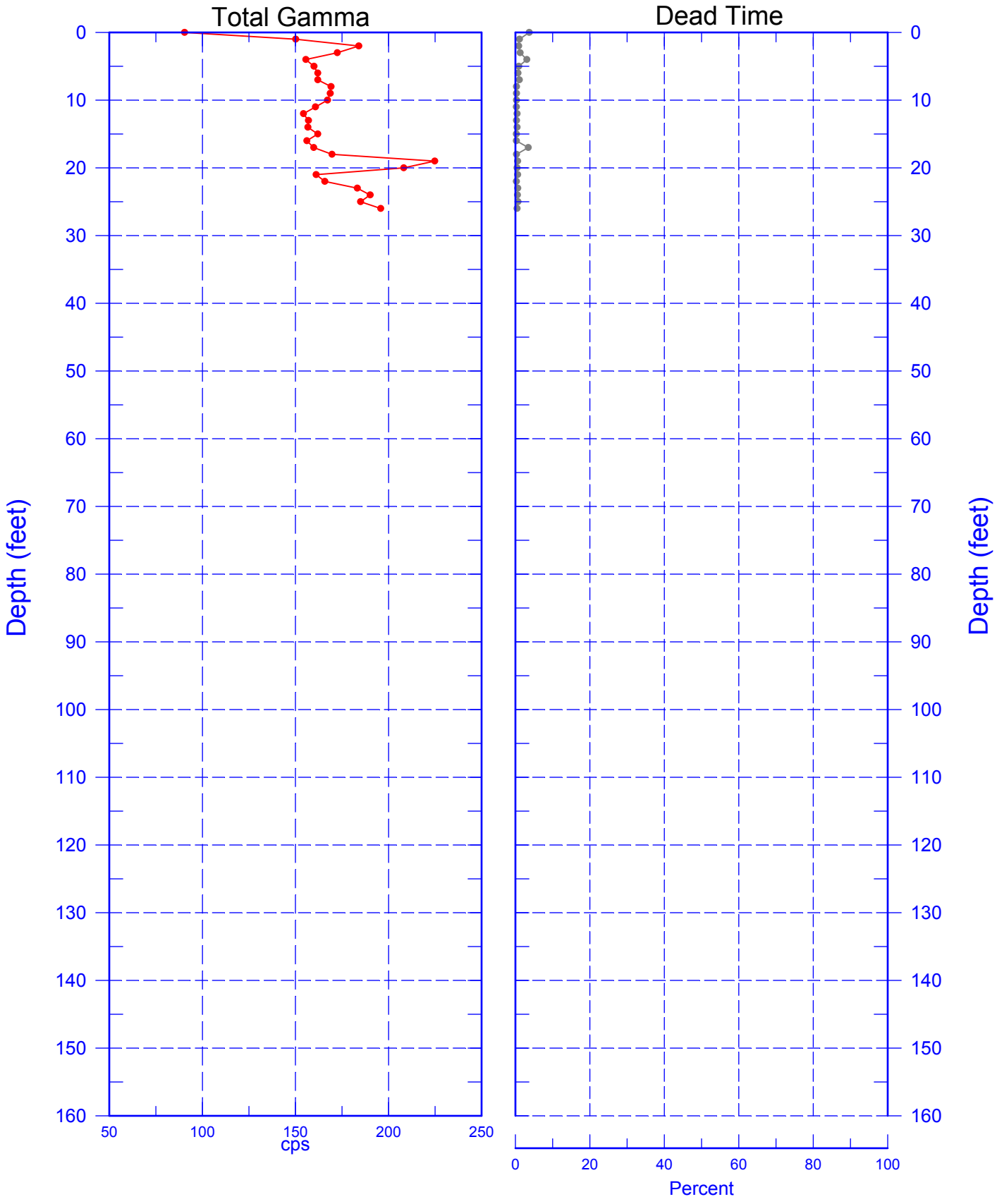


Zero Reference - Ground Surface

Depth scale: 1" = 5 ft

Last Logging Date - 09/27/04

699-17-27P (C4570)
Total Gamma & Dead Time



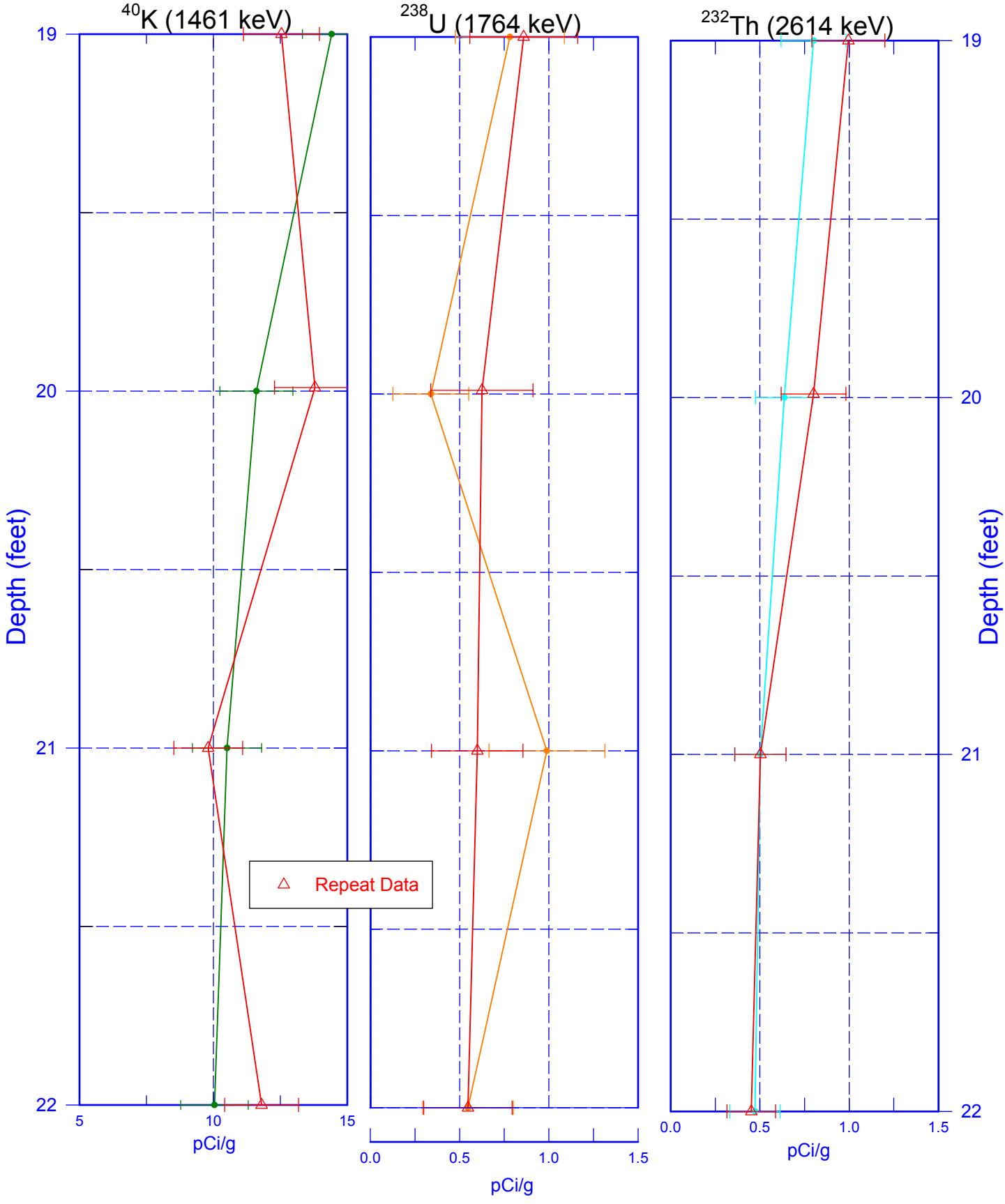
Reference - Ground Surface

Depth scale: 1" = 20 ft

Last Log Date - 09/27/04

699-17-27P (C4570)

Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Last Log Date - 09/27/04